

## Wooded Areas

### 1992

Densely wooded areas found at WNT are either prairie or savannas into which fire sensitive trees have grown or are woodlots created as a result of farmsteads or from seeds via birds, small mammals, water or wind. Interpretation of surveyor's notes and soil surveys indicates that true forest did not occur on WNT at the same time of European settlement. The herbaceous understory of these areas also does not indicate forest character; therefore, savanna communities are discussed under "Other Habitats".

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### 1994

Though no forested areas exist at WNT, there are some dense groves of trees located along steep sided agricultural gullies that are actively eroding. A low diversity and often a low density of highly shade tolerant herbaceous species and brushy species grow in the understory. Surveyor's notes made in 1846-1847 indicate that these areas were treeless or nearly so when prairie dominated the landscape. In 1994, tree removal began in some of these gullies so that a more natural drainage pattern and perennial herbaceous prairie vegetation could be restored.

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### 1995

Woodland communities on WNT consist of oak savannas diminished due to fire suppression, grazing, and timber harvest. An interpretive trail designed to preserve oaks and avoid important herbaceous understory vegetation was cleared during winter of 1994-1995 in the Thorn Valley site. Several Groups of school children, college students, and volunteers hand cleared small areas of this site. Woody stems were removed and burned, and stumps were treated with Garlon4 by WNT staff. During the summer, the cleared areas boasted an abundance of typical savanna species despite its sparse condition prior to clearing. Though this vegetation was damaged in construction, we expect much of the savanna will respond in a similar way as widespread clearing continues. The process of clearing is slow because of resource commitments to other needs, e.g. prairie harvest, planting.

Transplantation of savanna species to this site also occurred in 1995. In early spring, volunteers alerted Biologist Drobney of the presence of a good quality savanna remnant facing destruction due to Highway 23 improvement in Wapello County, Iowa. A segment of the roadside was preserved due to the presence of the state endangered species, false helebore. A combined effort of volunteers and WNT staff resulted in 15 pick-up loads of plants (a rare species of spiderwort, showy orchis,

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Culver's root, blue-eyed grass, dwarf larkspur, creamy gentian, wild bean, Michigan lily, starry companion, and several other species) from a 3-mile portion of roadside being transplanted in early spring and summer. Iowa DOT permission was obtained first.

Iowa Mennonite School Stewardship Day - In April high school students from the Iowa Mennonite School in Kalona spent a day at Walnut Creek. Students learned about Iowa's prairie heritage and cleared brush and trees from the "Buzzard Head" prairie remnant.

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### 1996/7

In 1996-7 we cleared approximately 5 acres of trees in natural community remnants including Thorn Valley Savanna, Coneflower Prairie, Buzzard Head, Don's I, and Don's II.

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### 1999

Approximately 3 acres of woody species have been selectively removed from prairie and woodland communities on the Refuge primarily by volunteers and students in environmental education experiences. A December 1998 burn of the Thorn Valley Savanna resulted in an increase in annual weed species in some areas that had formerly been dominated by a dense woody overgrowth, and in woodland wildflowers, sedges, and grasses in other areas.

Hundreds of orchids of three species including twayblade (*Liparis liliifolia*), showy orchid (*Galearis spectabilis*), and nodding ladies' tresses (*Spiranthes cernua*) were manifest and blooming profusely in summer of 1999 in the Buzzard Head Prairie remnant. A special project of one of the Prairie Builder Interns was to evaluate numbers of orchids and make management recommendations. As a result of this study and efforts by the Friends Prairie volunteers, orchid populations were found to be far more extensive than originally believed. The twayblade and showy orchids are primarily species of woody communities and the nodding ladies' tresses of prairie communities. Several young oaks and a number of characteristic prairie species in this area indicate that the area would most appropriately be managed as a savanna remnant.

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### 2000

**Management of Remnants** - Approximately 3 acres of woody species have been selectively removed from prairie and savanna communities on the Refuge, primarily by volunteers and by students involved in environmental education experiences. Remnant

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natural communities of primary focus include Dogleg Prairie, Coneflower Prairie, Buzzard Head, and Thorn Valley Savanna.

A spring burn of the Thorn Valley savanna has resulted in a shift to tall, early successional, native species such as Jerusalem artichoke (*Helianthus tuberosa*) mixed with annuals, replacing the brome. Sedges are becoming a more apparent portion of the flora. Weedy woody species such as multi-flora rose (*Rosa multiflora*) and raspberries (*Rubus occidentalis*) that once were very abundant are still present, though smaller in stature and apparently less dense.

**Drake University Course** - During Fall 1999 and Spring 2000, an experimental course at Drake University in Des Moines, Iowa entitled “The Walnut Creek Watershed Experience” was developed. This course was taught cooperatively by Dr. Richard Wacha and Biologist Drobney.

As a part of this course, students cleaned and inventoried seed, as well as propagating prairie plants from seed in the greenhouses. Students also organized a brush and tree cutting day involving other Drake University students. In addition, they assisted in repair of an eroding gully near the Prairie Learning Center.

**Walnut Creek Watershed Experience; a Drake University Course** - In FY 2000, collaboration between Neal Smith NWR and Drake University in Des Moines began. In early 2000, the Dr. William Ehmann, Director for Environmental studies at Drake, and Dr. Richard Wacha, Drake Professor of Biology, approached Project Leader Gilbertson, and Biologist Drobney to explore the possibility of establishing a cooperative program between the Refuge and the university. A class called ‘The Walnut Creek Watershed Experience’ resulted from discussions between Ehmann, Wacha and Refuge staff. The class was designed to give university students an experience that combined theoretical issues in prairie biology and restoration with pragmatic situations and hands-on creative problem solving on a landscape-scale restoration. Team-taught by Dr. Wacha and Drobney, students exercise some freedom in determining the projects they work with and develop throughout the semester, restricted by the needs of the Refuge.

The first group of students to enroll in this class began in the fall semester of calendar year 1999 and included Kim Barr, Dave Holman, Sid Juwarker, Jana Mott and Daniel Preston. They spent much of their time tracking down an elusive pair of transect lines running at 330 degrees through a degraded, yet relatively high-quality prairie remnant nicknamed the ‘Dogleg’ due to its shape as seen from above. Transects were originally established in 1994 following Floristic Quality Assessment techniques established by Swink and Wilhelm (1991). Relocation of these transect will allow repeat monitoring that will reveal whether vegetation is becoming more or less like high quality areas typical of Iowa in response to applied refuge management. In addition to relocating transects, the group established woody macro-plots and permanently marked the boundaries with physical stakes and by global positioning using a PLGR GPS unit.

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As a part of their training, Sid Juwarker, Jana Mott and Daniel Preston took the S-190 and S-130 course funded by the U.S. FWS, participated in pack testing, and as such, qualified to participate in Refuge prescribed fires. All three students participated in at least one Refuge burn. In addition, Jana Mott went on to use that experience as background in studies of Key deer and fire ecology in Florida, and Daniel Preston participated in wildlife suppression in the forest fires in Montana during the summer of 2000. Mr. Preston continues to be on-call for Refuge burn crew duty and has expressed interest in becoming a fire ecologist or advanced fire fighter after he completes his degree in Environmental Politics at Drake.

The spring, 2000 Walnut Creek Watershed Experience class was significantly larger, consisting of Marta Anderson, Courtney Barrick, Holly Karnitz, Adam Schneider, Maya Sherpa, Jim and John Warren, and Rose Winkeler. As a result, two groups were formed to undertake separate projects. One group organized the seed room and greenhouse, focusing on organizing seed and on inventorying stratified seed stored in coolers. These students independently initiated development of a seed stratification database to more easily facilitate seed work in the labs. In addition, they learned seed cleaning, accessioning and propagation techniques for prairie species.

The second group of students were mentored by two students from the fall semester, Daniel Preston and Dave Holman, who, inspired by their class experiences, took an advanced level course in the spring entitled "Special Topic: Prairie Restoration". These students continued to monitor woody macro plots and document species found on these areas. This group also arranged a stewardship day, enlisting the help of other Drake students to clear brush from the northern edge of the Dog Leg.

The Walnut Creek Experience continues to evolve as a dynamic interaction between a maturing refuge and the fledgling environmental program at Drake. Students represent a range of cultural diversity including student origins ranging from southern India to Nepal to third-generation Des Moines students, as well as a diversity of interests from English literature to grassroots activism to plant ecology. During the course of the year, the program has grown to focus on the Dogleg Remnant, marking this remnant as a distinct project area for Drake students. Difficulties to overcome include incorporating enough lab time to accommodate both travel time and refuge experiences. The need for a continuous interaction—one that bridges those months which are most active for the refuge—has become an impetus to develop a summer section of the Walnut Creek Watershed Experience sometime in the future.

In April, the Scout Jamboree hosted 236 Boy Scouts and leaders who volunteered 758 hours towards upland restoration stewardship projects such as tree removal and planting tallgrass prairie species.

As several years of restoration and reconstruction efforts on the Refuge have begun to bear fruit, the Friends of the Prairie Learning Center sought to become more directly involved in the restoration process. The site selected was a 20-acre parcel along the east

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end of the Tallgrass Trail. Work on the Friends' Prairie was initiated in 1998 and has since become a premier restoration site.

On the second Saturday of every month, the Friends of the Prairie Learning Center held a stewardship event at the Refuge led by a member of biology staff. Participation ranged from 5 to 50 people who usually worked from 9:00 a.m. to approximately 1:00 p.m. The activities varied based on the time of year and included exotic tree cutting/removal, exotic invasive removal, native seed collection, seed cleaning, seed sowing, gully repair, and orchid labeling. These fun work days give Friends the opportunity to understand the challenges of ecological restoration of the Refuge first hand, and not only assists the restoration process, but provides a foundation for interpretation of the Refuge to the public they address on our behalf.

**Friends of the Prairie Learning Center** - The Friends continue to be a breath of fresh air for the refuge. They supported and/or completed a number of projects for the refuge and for themselves. The following is a list of highlights from the Friends' annual report:

Continued Stewardship Saturday. The Friends support the refuge every second Saturday of each month by volunteering a day for land stewardship. They have "adopted" a section of the refuge by the Tallgrass Trail where they are removing trees from a degraded savanna.

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## **2001**

**Monthly Biology Stewardship Activities** - The Refuge Friends group holds volunteer stewardship activities on the second Saturday of each month and a smaller yet equally dedicated group of volunteers turned out on the last Thursday. The Second Saturday stewardship days are focused on the Friends' Prairie area of the Refuge which provides the Friends with an opportunity to develop a sense of ownership and responsibility for a piece of the Refuge. The workdays also serve as an educational and recreational connection to the reconstruction process. The Second Saturday stewardship days have proven to be effective tools for harnessing the power of a dedicated work force to accomplish Refuge needs and goals. Though a crew of 6 to 60 people of all ages is possible, a dedicated core of regular attendees helps coordinate activities efficiently with Refuge staff. Their knowledge of Refuge needs and goals allows them to work more independently and accomplish more.

The Thursday evening events were requested by Refuge volunteer Jonathan Yentis as an alternative time for those not able to regularly attend the Saturday events. We also try to have a member of the staff take part to incorporate an educational program related to the work to be performed. Fewer volunteers are able to attend, but a smaller group allows us to interact more personally with them and increase the educational value of the experience. Many of those who attend the Thursday evening programs also attend the

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Saturday events and they have been able to assume leadership roles for less experienced volunteers.

Some of the efforts for which the volunteers have played a key role include seed collection and processing, invasive species removal, brush clearing, and bluejoint grass potting. These fun and educational events have become a focal point for volunteer activities.

Maintenance Mechanic Brian Boot took possession of the Hydra-axe for several weeks and took out about 40 acres of larger trees and brush areas. The dramatic change was evident from day to day as the face of the prairie landscape began to emerge in many areas.

We closed out the year by turning our attention and our backpack sprayers on woody invaders, with black locust (*Robinia pseudoacacia*) the most numerous target. Some were given basal bark treatment but the majority were stump treated following cutting.

School groups also aid in donating time and energy. Sixty school groups donated over 5,000 hours collecting seeds, cleaning seeds, and removing brush.

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### 2003

Hundreds of trees are removed and thousands of seedlings are planted (2.b) In May, 90 students from Knoxville High School and their teacher, Curt Froyen, came for an annual stewardship day. This has been a six-year tradition with the Knoxville school and has become very popular with the students and teachers. With supervision from Range Techs Kelly Egen and Jeff Braun, an impressive number of trees were cut and brush piles made for future burning on the south side of the Thorn Valley Savanna Unit. Intern Chad Reed also supervised students that weeded a significant portion of the production plots.

Rick Hager and the YCC enrollees removed over 150 metal posts from the Old Schoolhouse Unit to diminish hazards during mowing and prescribed fire operations. They cleared more than 100 trees from a three acre prairie remnant, transplanted more than 1,000 prairie plants into the production plots, and weeded invasive plants, mainly sweet clover, thistle and curly dock from primary harvest areas. The crew weeded, cleaned and graded bench areas along the Tallgrass Trail, removed barbed wire, woven wire and metal/wood posts from over one mile of fence line to prepare fall 2003 restoration planting areas. The crew removed hundreds of small trees, mainly cottonwood, locust and willow from road ditches and fields, then treated the stumps to prevent re-growth.

A “patch mix” was used by staff to inter-seed in areas of soil disturbance. Black locust trees were cut within the Thorn Valley Savanna and the south side of the High

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Point units and stumps were treated with Garlon 3A to prevent the trees re-growth. The Prairie Learning Center parking lot medians were tilled and reseeded in areas that had been sprayed earlier to remove non-local ecotype switchgrass.

SCA crewmembers spent a great deal of time, and a lot of sweaty hours, cutting honey and black locust trees in the Thorn Valley Savanna unit. They were able to clear a fairly significant area for future management.

During July, Hager and the YCC crew removed several large trees from an old home site to prepare for fall planting of the area. The crew hand collected spiderwort seed for prairie restoration and cleaned and sterilized over 1,000 conetainers for reuse in the greenhouse next season. The crew assisted EE in removing downed trees and sumac in the Savanna Trail area, they also assisted EE in transplanting over 7,000 plants adjacent to the Overlook Trail. YCC also worked hard in transplanting several hundred plants into the production plots.

Maintenance Mechanic Boot used the hydra-axe during FY02 and the beginning of FY03 to clear approximately 25 acres of trees during FY03. Van Zee used a tree shredder to cut 450 acres of trees encroaching into the prairie restorations. S. Van Ryswyk and Van Zee removed over 1 mile of fence. This removal of fence gives the area a more undisturbed look and eliminates some safety issues.

As a tallgrass prairie restoration site, our focus is on restoring prairie, not on forest management. However, we are currently trying to restore a 40-acre oak savanna site to its native appearance, this would be our forest management. We have been removing unwanted trees such as black locust, ash, elm, and maple to open up the canopy so light will reach the ground.

Throughout the spring, summer and early fall, crews of volunteers and staff worked to clear trees and brush from the savanna. Small trees were clipped and cut using loppers and bow saws, while larger trees were cut using chainsaws. All of the brush was removed and piled outside of the savanna to be burned at a later date. All of the stumps were treated with Garlon 3A to prevent the sprouting and re-growth of the trees that were removed. The SCA and range tech crews spent a great deal of time removing and treating black locust trees from the area.

The refuge currently maintains a nature trail that winds its way through the oak savanna. This allows visitors to monitor our progress in the restoration process. A burn plan has been established for this unit as well. The burning of the savanna will allow us to knock back some of the undergrowth, stimulate growth of the understory, as well as help to eliminate some of the trees that are not fire tolerant. Our future management plans for this area are to continue to remove invasive species of trees and treat the stumps with chemicals to prevent any regeneration of the tree. Burning of this area will help also help to prevent any regeneration of these trees as well. In our more wooded areas we have experienced problems with the invasion of black locust and willows. In our Oak Savanna restoration area we spent a great deal of time

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this year removing and treating black locust trees and saplings. Trees were cut using chainsaws, bow saws and loppers by refuge staff as well as a number of school groups and volunteers. Remaining stumps were then treated with Garlon 3A to prevent their regeneration. Because black locust sprouts from the stump and the roots, this poses a challenge to completely eradicating it, however, once the stumps are treated with Garlon we are improving our odds in controlling its spread.

Prairie Rescue Day and fall was the perfect time to do stewardship to restore prairies. Below coordinated 113 volunteers who showed up to cut and remove willows from the prairie, collect seeds from our production plots, and clean seeds in our labs. Drobney prepared a summary of ecological restoration and refuge significance, and Charland prepared a brief summary of the grassland bird species commonly seen at Neal Smith NWR for inclusion in a Field Guide to the prairies of the Midwest.

**Earth Day** - Murray coordinated Earth Day activities on Saturday, April 19<sup>th</sup>. Murray gave a briefing and divided the crews up among several different areas. Crews worked on the prairie production plots; the savanna restoration project for tree cutting and brush removal, and Shea directed some local Boy Scout troops to specified trash pickup zones along the main road.

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## 2004

The Refuge had a very active year in the area of upland restoration, from shearing and removing trees to picking and cleaning seed. Brian Boot, Maintenance Mechanic, spent a great deal of time operating equipment to prepare areas for seeding, spending several days shredding trees on the Birkenholtz site for converting cropland to prairie. Brian was also able to prepare three additional sites, Cabbage, Curry and Kane, for seeding and grading by mowing fence rows, shredding trees and removing trash and metal posts.

In February, a contractor cut trees in Thorn Valley Savanna to further savanna restoration. Staff followed behind chemically treating stumps to prevent regrowth. Excellent progress was made and a wide area was successfully cleared freeing up oaks to sunlight and promoting regeneration of young oaks as well as savanna ground cover. Volunteers worked steadily to remove the trees and brush from the savanna and form brush piles to be burned in winter. Some of the wood was made available to the public through a special collection permit.

Maintenance Mechanic Boot used the hydra-axe during FY04 on approximately 25 acres of trees. Van Zee used a tree shredder to cut four to five acres of trees encroaching into the prairie restorations (photo 30).

**Black Locust** - There are five known sites of black locust on the Refuge, with two sites complicated by adjacent, cloning populations on private property. Staff and volunteers have been especially concentrating efforts on areas with relatively fewer trees in order to gain control on at least three of the five populations. This species spreads aggressively

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by root and can overtake an area in only a few years if left uncontrolled. Efforts seem to be paying off, with fewer trees appearing in treated areas than in past years.

This year, many hours were spent cutting and chemically treating black locust saplings around the Prairie Learning Center and on Thorn Valley Oak Savanna. After cutting, stumps were treated with Garlon 3A to prevent regeneration of the trees.

Special Use Permits were issued authorizing collection of firewood to four individuals, one for removal of willows, two for removal of old wire fencing material and wood posts and one to collect foundation debris.

The YCC crew built a butterfly garden with 1100 square foot brick walkway, benches, rock wall, boulder and a “puddle” for the butterflies to drink from; cleared approximately three miles of fence; surfaced part of a public use trail with wood chips and built a boardwalk over a wet area; cleared invasive species from prairie plantings and planted seedlings; harvested seed; removed non-native plants from future harvest sites; and cleared brush and trees from prairie remnants, plantings and fence lines. They also aided in the maintenance of the Refuge by litter removal, cleaning offices, washing vehicles and cleaning storage areas and sheds (photos 62 – 66).

Earth Day with 176 people participating in cleaning seed, clearing trees and brush, trash removal from dump sites and the roadways, and fence removal. This year, Congressman Leonard Boswell planted some seedlings and addressed the volunteers during a lunch break to thank them for all their hard work.

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## 2005

Tree removing and cutting has begun with Hager and Boot both working in potential seeding sites.

-(December 2004, FY 2005)

Boot started removing trees in late December and has already cut down approximately 100 trees.

-January 2005

Operations staff was busy with snow removal and weather related needs so habitat restorations were limited. On days without snowfall Boot, Hager and Severson worked on tree removal in the north middle unit. They did a tremendous job and the area will be much improved.

Boot sheared several acres of trees (see 2 b.)

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-February 2005

Hager and Cline (volunteer) removed several large trees along Burkenholtz seeding area. This really opened up area for seeding and should help getting a fire to carry into these areas. Boot had worked in this area earlier in the month and removed numerous small trees with the skid-steer. So many trees were removed in this area that it will be visible on aerial photos.

Larry Cline continues to work hard during the winter working with Hager. Cline and Hager have been clearing areas of non-native trees next to the newly planted prairies.

-March 2005

Public Use, Biology, and Operations staffs teamed up for a day of intensive tree cutting on the south end of the Old Game Farm in the Savanna Reconstruction management unit. Murray will oversee 1500 scouts who will participate in stewardship activities to remove the trees over a three-day project in July.

A tremendous amount of work went into removal of several hundred trees in the old game farm area. Rich, Boot, Hager, Krueger, Severson, Braun and Hollerich all worked on cutting trees and brush for a future Boy Scout project. Approximately 5 acres of trees were removed in one day. The project will be the removal and piling of the trees. This is to take place in July. Allen reported later in the day to provide chemical treatment to all downed trees. Boot continued tree treatment on the newly planted Burkenholtz unit. This unit has really changed in the last two years due to Hager's, Severson's and Boot's considerable work done in this area.

A permit was issued to Robert Peck for firewood collection.

-May 2005

The 2005 Iowa Junior Duck Stamp Contest Award Ceremony was held on May 14. This year there was a record 525 Iowa entries. Out of the top 100 winners, 30 students along with friends and family attended the ceremony, filling the multi-purpose room beyond capacity. Scott Ford, Public Use Specialist, served as Master of Ceremonies. Maynard Reece, the only five-time winner of the Federal Duck Stamp Contest, was the speaker. He brought some of his artwork for display, but most interesting was a sketch with which he won a contest when he was 12 years old.

-June 2005

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At the request of the Refuge, Linda Haugen (US Forest Service), and Aaron Flickenger (Iowa DNR) evaluated the condition of refuge oaks showing signs of leaf browning, leaf drop, and other stresses. Cause of oak mortality in one tree in the Old Game Farm savanna site was also discussed. Samples were taken from the refuge and from an oak across the road from the refuge that seemed to be seriously declining. Samples were sent to the ISU plant pathology lab.

-July 2005

Cultivar switchgrass was manually removed in Coneflower Prairie remnant. Black locust was cut and treated in west side of Thorn Valley Savanna. Boot sprayed *Lespedeza cuneata* on 15 acres. Musk thistle head were removed and plants grubbed out in 10 acres around the refuge. Canada thistle was mowed and areas interseeded on approximately 100 acres.

On July 21<sup>st</sup> through July 26<sup>th</sup>, Murray coordinated the activities of 1,380 Calvinist Cadets, who were participating in an international Camporee. Neal Smith National Wildlife Refuge hosted daily group stewardship/service projects for the cadets. Each day saw four groups of 70 scouts rotating through the project site. Each group was greeted and given a safety briefing. They were also given an overview of refuge objectives regarding savanna restoration. The groups then constructed brush piles and cleaned the area. More than 3.5 acres of refuge land was cleared. Many scouts expressed a very positive reaction to the experience. Even with all of the intense and arduous physical activity taking place, no serious injuries were reported.

-August 2005

Black locust near Thorn Valley Savanna was cut and treated with Garlon.

-October 2005

-Comparative ecosystems: Field assistants work to remove and treat trees and shrubs in the research portion of Orbweaver unit.

One local resident was issued a special use permit to collect wood from the Refuge.

-November 2005

Trees were removed in the North Middle Unit with the tree shredder.

Fire Crew, Operations, Biology, Public Use, and volunteers worked on tree removal this month in various parts of the refuge.

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-December 2005

Two wood collection permits were issued.

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### 2006

-January 2006

Drobney, Gilbertson, and research assistant Dave Williams met with potential contractors to perform tree cutting/stump grinding necessary in SW Basswood Unit to facilitate future research.

Boot, Krueger, Severson, Hager and volunteers continued the clearing of trees of brush in the North Middle Unit. Approximately 30 acres will be cleared and planted to tallgrass prairie.

Two individual special use permits were issued for firewood collecting.

-February 2006

Krueger spent much of the month assisting on removal of trees at the North end of the Refuge (see RX fire). Krueger, Hager, and volunteer Larry Kline cut all trees in the draw just south of the information kiosk.

During the month of February, three permits were issued for collecting wood and one of those was issued to lumber and milling company in Iowa, allowing the permittee to remove approximately 16,500 board feet of maple and 19,000 board feet of cottonwood/elm/walnut trees.

-March 2006

Boot, Krueger, Hager, Severson, Welsh, volunteer Kline worked on the North Unit to remove trees for prairie restoration. A total of 30 acres of trees has been removed so far. Additional work including stump grinding, wood chipping, piling, and burning is continuing.

A Special Use Permit was issued to an individual to allow firewood collection.

-April 2006

Costello cleaned and weeded over-wintered plants in the production greenhouse. Krueger and Costello moved forward with work on the production plots, edging, repairing water lines and removing weeds. Earth day activities assisted with restoration projects including planting in the

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butterfly garden, removing fencing, removing and treating woody vegetation, and removing garbage from the refuge.

Permits to collect firewood were issued to Eileen Mercuris and Charlie Pinegar.

Second Saturday Stewardship held on the 8<sup>th</sup> saw over twenty volunteers working with volunteer coordinator Al Murray and Jonathan Yentis clearing brush or finishing up work in the seed lab.

Earth Day: On the 22<sup>nd</sup> Murray coordinated Earth Day 2006 activities here at the refuge. Working with staff members developed projects for the 200 participants attending. Work was accomplished in a number of areas. Viste–Sparkman worked with volunteers sorting greenhouse plant stock and working in the butterfly garden. Krueger and Allen worked with a crew clearing and treating willows along the entry road. Hollerich and Hager worked with large crew constructing brush piles at buzzardhead savanna restoration site. Severson worked with crew removing fencing from the Orb weaver unit. Murray coordinated the efforts of seventy Cub Scouts and adult leaders removing trash from refuge roadways. At the end of the morning Gilbertson, Ford and Macdonald worked with volunteers to get everyone fed. Lunch was provided by Friends of the Prairie Learning Center.

-May 2006

Hager and Allen treated ~ 10 acres small trees and stumps with Garlon 4 in North Middle and NE Entry Units. Boot continued working on moving trees and brush that had been cut at the North Unit. Stump grinding and tree chipping continued. Hager and Allen mowed several acres of sumac in Coneflower and Thorn Valley Units.

-June 2006

Boot continued working on North Unit to clear downed logs and oversee operations of grinding stumps and chipping wood.

-August 2006

One permit for collecting firewood was issued.

-September 2006

Boot began shredding trees on the north end of the refuge in late September.

Gilbertson met with a past permittee who was interested in working under a special use permit again this year to remove unwanted trees on the refuge. Several sites were investigated.

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October 2006

Boot and Krueger shredded brush and trees on Dog Leg Unit. Boot, Krueger, and Hager cut and shredded trees at East Bobolink Unit in preparation for seeding this winter.

October was a busy month for stewardship beginning with the completion of an Eagle Scout project along the entry road in the Coneflower unit. The scouts contributed over 400 hours of service toward this project in September and October. The objective was to remove invasive and non-native trees and fencing. Volunteer Dunagan assisted with tree removal; scouts then constructed brush piles. Fencing and scrap were removed.

-November 2006

Hager, Krueger, Boot and Eike continued to cut and remove trees from the East Bobolink unit to prepare it for seeding. Boot and Krueger worked several days with employees from Vermeer to chip trees and help reduce the need for large brush piles.

Viste-Sparkman led the Field Biology class from DMACC's Newton campus in removing a patch of black locust from the Thorn Valley unit. Murray and Hager followed up with stump treatment.

Murray and Eicke are cutting trees and brush and herbicide stump treating at Buzzard Head.

Two wood collecting permits were prepared this month.

-December 2006

Boot, Hager, Krueger, Allen and Bruns continued tree removal on the East Bobolink, Dogleg and Coneflower units. Trees are being piled for burning as well as chipped to help reduce the number of brush piles. Logs were set aside for firewood collection by the public as well.

Two special use permits were issued granting permission to collect firewood.

Eiche completed his nine-week internship at the Neal Smith NWR. Eiche worked well with the students at the refuge and accomplished much during his time here. He not only completed a brochure on the mammals of Neal Smith NWR but began a brochure on the reptiles of the refuge as well as cutting down many trees and assisting with stewardship on Fridays.

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**2007**

## Wooded Areas

-January 2007

Tree removal and chipping continues on the Coneflower and Dogleg units, slow but steady progress is being made. Recent extremely cold weather has slowed progress due to cold personnel and equipment. The remaining trees on the East Bobolink unit have been chipped or piled and the unit is ready to be planted once the snow melts. A local manufacturing company is testing out its new equipment so the chipping and stump grinding so there is no cost to the refuge.

Permits for collecting firewood were issued to Robert Peck and Craig Schuchhardt. A permit was issued to Phil Prybil to allow entrance, cutting and removal of wood. Eric Wiggins received a permit for wood collecting.

-February 2007

Hager and volunteer Larry Cline continued cutting trees in Dogleg.

-March 2007

Much of the month was spent cleaning up the trees that were cut down this winter -- no small feat! Well over 25 acres of trees were cleared this winter and needed to be cleaned up. Boot, Krueger and Hager spent many hours piling, chipping and just plain tidying up the "mess" that was left.

Hollerich and Simmen worked with school groups clearing brush on the west end of Buzzard Head Prairie. Two massive brush piles have been started. Work will continue on this area until the sensitive flowers begin to emerge. A total of 175 hours were spent working on brush removal at Buzzard Head. Another 40 hours were spent transplanting seedlings at the greenhouse.

A special use permit was issued for wood collection.

Murray and Volunteer Dunagan continued felling trees on an old and new Eagle Scout project sites on the entry road near 88<sup>th</sup>.

-April 2007

Hollerich led volunteers on Earth Day in cutting brush at Buzzard Head. Throughout the month school stewardship projects and other habitat restoration efforts were focused on the western side of the remnant. Much progress was made and about an acre and a half were cleared of woody vegetation allowing the native plants to grow back.

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On April 17 a group of Central College students came to the refuge for their annual service day. They worked with Viste-Sparkman, Murray, and Simbro in removing downed wood from the Dogleg remnant prairie.

Hager, Krueger, and Murray felled and bucked up trees along Walnut Creek.

A special use permit was issued to Tom Prall for collecting wood. Hager and Krueger cleared brush from farm fields. Hager checked gates and access points for farmers.

On the 21<sup>st</sup> 70 volunteers joined staff to observe Earth Day. Stewardship was the focus of the event. Staff and volunteers worked clearing brush, cleaning the production plots and organizing plant stock in the greenhouse.

On the 28<sup>th</sup> approximately 60 scouts and adults from the Mid-Iowa Order of the Arrow joined volunteer coordinator Al Murray and volunteer Mark Dunagan on two sites along the entry road removing trees and brush at two former Eagle scout project sites. These efforts completed the tree clearing on these sites.

-May 2007

'Tis the season of mowing. Operations staff has begun to mow new plantings, areas of resprouting trees, as well as Canada thistle and sweet clover sites. Staff started looking for *Lespedeza cuneata*, GPS'ing its location so it can be tracked, and treating plants. Also, several hundred tree stumps were treated with Garlon to prevent them from re-sprouting. Krueger used the excavator to remove trees from Walnut Creek during an Eagle Scout project so the trees could be bucked up and piled for burning.

Special use permits were issued to Dana Sanders and Mark Van Houweling for wood collecting.

May saw the kick off of another large tree removal project along the entry road in the Henslow Hill unit. Eagle Scout candidate Jacob Wilkinson, scouts and adult leaders from troop 78 in West Des Moines joined staff on May 12<sup>th</sup> to initiate the project. Ops staff member Jeff Kreuger operating the excavator assisted volunteer Mark Dunagan bucking trees while the scouts constructed brush piles. The goal of this project is to remove trees along the creek and open up the viewscape towards the Bison enclosure from the entry road.

-June 2007

## Wooded Areas

Range Tech. Molly Caldwell, Nick Allen and the YCC crew spent several days working along the entrance road cutting down small trees and chemically treating them in an effort to prevent them from spreading.

A wood collecting permit was issued to Jonathan Yentis. Eagle Scout project was completed in June as well. Working with Ranger Al Murray and volunteer sawyer Mark Dunagan. Jacob and his scout troop completed clearing a ½ mile section of trees along the creek parallel to the entry road. The project opened the viewscape allowing visitors a more complete view of the NE corner of the Bison enclosure.

On July 16<sup>th</sup> & 17<sup>th</sup> the refuge hosted a large Camporee service project for the Calvinist Cadet Corp. Staff members Krueger, Groom and Murray along with YCCer's worked to buck up felled trees in advance of the event. When the scouts arrived they worked as a group to create brush piles that in the end cleared an area of approximately 4 acres of downed trees along the entry road.

-August 2007

A permit for wood collecting was issued to Debra Peterson.

Krueger mowed black locust patches on the Highpoint unit, areas will be sprayed with Krenite once the trees begin to resprout.

-November 2007

Krueger and Boot have begun tree shredding in the ditches and smaller easy to reach areas in an effort to help control the spread of trees into the prairie.

-December 2007

Boot, Krueger, and DeBruin continued work on tree removal at Coneflower.

Volunteer Mark Dunagan worked with Murray for two days on the 26<sup>th</sup> & 29<sup>th</sup> felling & bucking trees at the 88<sup>th</sup> & Entry Rd. Eagle project site in preparation for the conclusion of that project in January.

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## 2008

-February 2008

## Wooded Areas

Boot, Krueger and Debruin continued the removal of downed trees on the Coneflower unit, piling and burning as they went.

Tree removal continued at Coneflower

Two individuals were issued wood collecting permits.

-March 2008

A wood collecting permit was issued, and five Special Use Permits for researchers for the 2008 field season were prepared.

-April 2008

Viste-Sparkman led 15 Central College students in a Service Day activity of cutting and removing black locust from the PLC unit near the Tallgrass Trail on 15 April. Hager continued with this activity with a group from DMACC on Earth Day.

Wood collecting permits were issued to Patricia Hager and Andrew Elbert.

-May 2008

Volunteer Larry Fudge sprayed black locust and willow stumps in the PLC unit that had been cut earlier during Earth Day. The Refuge biology interns began treatment of two small patches and one large patch of black locust in the Thorn Valley unit. They are making great progress.

Special use permits for wood collecting were issued to Dan Brickner & William VanMaanen.

-August 2008

Krizman, Day, Sokolowski, Brickner and Murray did some tree cutting in preparation for the Coyle Eagle scout project on 88<sup>th</sup> street on the 20 & 21<sup>st</sup>.

-September 2008

One wood collecting permit was issued.

On Saturday September 4<sup>th</sup> Eagle Scout Matt Coyle and twenty five scouts and adult leaders from Newton, IA worked with Vol. coordinator Al Murray to clear and brush pile slash from a three acre area of prairie along a creek off 88<sup>th</sup> St. in the old school house unit.

## Wooded Areas

-October 2008

Krueger, Boot, DeBruin, and Hager cleared trees on the refuge along a refuge property to allow the neighbor to rebuild an old fence that was falling apart and overgrown with trees.

-November 2008

Ostermann cut and treated honeysuckle in the Thorne Valley savanna.

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### 2009

-January 2009

Boot and Debruin, along with assistance from Hager, Krizman, and Murray continued with tree removal in Coneflower Prairie. Vermeer Equipment Company ground stumps for several days. The area should be finished and ready to plant by March 1.

Krizman worked on priority training nomination for EAAC. Krizman, volunteer Dave Novak, and Al Murray cut trees for 2 days across from game farm and Savanna Reconstruction on the left of the road in. Krizman assisted Private Lands Coordinator Helmers, on January 7, with public contact in Pleasant Hill with respect to prescribed burning. Krizman worked on seasonal hires.

Wood collection permits were issued to three local residents.

-March 2009

Boot and Debruin continued stump and tree removal on the Savanna Restoration tract in preparation for planting. Boot worked on the heat field leak by the west mechanical room, and received bids for glycol and someone who could perform the detection work. He and Debruin made several repairs to equipment, HVAC and various other building problems. Boot planted Savanna Restoration and Coneflower Tracts.

-April 2009

Tree removal was halted for the year. All totaled, several hundred trees were cut and piled; stumps were ground and treated by Boot, Debruin, Krizman, Hager, Rassmussen, and Murray.

A wood collecting permit was issued to Patricia Hager.

## Wooded Areas

Big month for the volunteer program! On the 18<sup>th</sup>, over one hundred twenty volunteers participated in this year's Earth Day (spring prairie rescue) here at the refuge. Volunteers from 24 different Service groups, scout groups and families spent the morning working with staff members cleaning the production plots, laying retention matting, clearing brush, working in the greenhouse and clearing trash from refuge roadways! In all volunteers contributed nearly 600 hours of volunteer time.

-May 2009

Boot ground stumps at Coneflower Unit.

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